

## CLAIMS

What is claimed is:

1. A method for quantification of strain imaging comprising the steps of:
- (a) performing a motion analysis on at least two selected regions of interest (ROI) before and after tissue compression;
  - (b) providing a strain estimate for each of the at least two ROIs; and
  - (c) comparing the strain estimates of each of the at least two ROIs to quantify the strain for the at least two ROIs.
2. The method of claim 1 wherein the performing step (a) comprises the steps of:
- (a1) generating a plurality of blocks for each of the at least two ROIs; and
  - (a2) utilizing a block matching technique to perform a motion analysis on each of the at least two ROIs.
3. The method of claim 2 wherein each of the plurality of blocks touch a boundary of the at least two ROIs.
4. The method of claim 1 wherein the providing step (206) (b) is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of  $i$ -th A-line,  $d_i$  is a

7 distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image  
8 covering the ROI.

1 5. A method for quantification of strain imaging comprising the steps of:

- 2 (a) performing (206) a motion analysis on a plurality of selected regions of interest  
3 (ROIs) (302 and 304); the performing step (a) further comprises the steps of: (a1) generating a  
4 plurality of blocks (150) for each of the at least two ROIs (302 and 304); and (a2) utilizing a  
5 block matching technique to perform a motion analysis on each of the plurality of ROIs (302  
6 and 304), wherein each of the plurality of blocks (150) touch a boundary of the at least two  
7 ROIs (302 and 304);  
8 (b) providing a strain estimate for each of the plurality of ROIs (302 and 304; and  
9 (c) comparing (208) the strain estimates of each of the plurality of ROIs to quantify  
10 the strain for the at least two ROIs (302 and 304).

1 6. The method of claim 5 where the strain estimate is performed in accordance with  
2 the equation:  
3

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

4 where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for  
5 two blocks, which cross over the boundary of a specific ROI, in the direction of  $i$ -th A-line.  $d_i$  is  
6 a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image  
7 covering that specific ROI.  
8

1 7. A computer readable medium for quantification of strain imaging including  
2 program instructions for:

- 3 (a) performing (204) a motion analysis on at least two selected regions of interest  
4 (ROI) before and after tissue compression;  
5 (b) providing (206) a strain estimate for each of the at least two ROIs; and

6 (c) comparing (208) the strain estimates of each of the at least two ROIs to quantify  
7 the strain for the at least two ROIs.

1 8. The computer readable medium of claim 7 wherein the performing (206) step (a)  
2 comprises the steps of:

3 (a1) generating a plurality of blocks (150) for each of the at least two ROIs (302 and  
4 304); and

5 (a2) utilizing a block matching technique to perform a motion analysis on each of the  
6 at least two ROIs (302 and 304).

1 9. The computer readable medium of claim 7 wherein each of the plurality of  
2 blocks touch a boundary of the at least two ROIs (302 and 304).

1 10. The computer readable medium of claim 7 wherein the providing step (206) (b)  
2 is performed in accordance with the equation:  
3

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

4  
5 where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components for  
6 two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line,  $d_i$  is  
7 a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode image  
8 covering that specific ROI.

1 11. A computer readable medium for quantification of strain imaging having  
2 program instructions for:

3 (a) performing (206) a motion analysis on a plurality of selected regions of interest  
4 (ROIs) (302 and 304); the performing step (a) further comprises the steps of: (a1) generating a  
5 plurality of blocks (150) for each of the plurality of ROIs (302 and 304);

6 (a2) utilizing a block matching technique to perform a motion analysis on each of the  
7 plurality of ROIs (302 and 304), wherein each of the plurality of blocks touch a boundary of the

9 plurality of ROIs (302 and 304) ;

10 (b) providing (206) a strain estimate for each of the plurality of ROIs; and  
11 comparing (208) the strain estimates of each of the plurality of ROIs to quantify the strain for  
12 the at least two ROIs (302 and 304).

13  
14 12. The computer readable medium of claim 11 where the strain estimate is  
15 performed in accordance with the equation:  
16

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

17  
18 where ST is the strain estimate; and where  $a_i$  and  $b_i$  are the displacement components  
19 for two blocks, which cross over the boundary of a specific ROI, in the direction of i-th A-line.  
20  $d_i$  is a distance between the two blocks, and  $i_1$  and  $i_2$  are indices along an A-line on a B-mode  
21 image covering that specific ROI.  
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